

INAUGURAL ADDRESS OF DR. LEE DE FOREST*

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FOR ONE who has been privileged to have had a part in the erection even from its foundation stones of the great fabric which is the Radio Industry of today—it is no easy matter to express adequately the deep sense of appreciation and of responsibility which my election to this honored office imposes.

Because the memories of my first labors in this field of wireless go back further than those of most of you today, I can realize, perhaps more than many of you, the great magnitude of service which you members of the Institute of Radio Engineers have achieved.

Little, indeed, of today's splendid achievement was envisioned by the small band of pioneers who began with the present century the creation of wireless communication.

At a time when our only source of wave energy was the open spark gap, the only detectors, the coherer and anti-coherer, when 10 miles of sea were considered wide-open spaces, when all antennas were vertical and a wave-meter was unknown, it required more than a prophet to foresee just what radio communication was destined to become.

The way to a definite organization of effort, to an accurate science, as we pioneers traversed it year by year, seemed at the time devious, and long, and frequently discouraging. Yet in retrospection, after a scant three decades, the progress made by that constantly increasing group of radio engineers now seems fairly rational and consistent.

Starting with nothing but a general understanding based on Hertz and Maxwell, the speed with which our first primitive methods and instruments were scrapped and superseded by those of greater refinement, larger power, and higher selectivity, was surely in full keeping with the most advanced practices which the older science of electrical engineering was even then establishing.

Competition among the few in the field during the first decade was fully as intense and exacting as at the present. International pride in wireless achievement began at the very beginning to spur us to radical advances. Added to this was the keen struggle among the two or three American companies for every eager crumb of patronage which a doubtful Navy, and an economical Army Department could be induced to offer.

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Inventors were few in those days. Invention was easy, the soil exceedingly fertile, and the Patent Office not yet clogged with thousands of pending applications on insignificant or hardly distinguishable details. Consequently the incentive to strike out and pioneer on paths radically new and therefore wondrously attractive was intense. In rapid succession followed the auto-detector, (electrolytic and crystal types), the telephone receiver, the alternating-current transmitter, the two tuned circuits at sender and receiver; the high-frequency spark, the quench spark gap, the Poulson Arc and Tikker, the direction finder, the series-selective circuits of Stone, the heterodyne principle, the audion as detector and telephone amplifier, the Alexanderson high-frequency generator, and the audion oscillator, first regenerative for heterodyne reception, then as transmitter for telegraph and telephone. All of these kaleidoscopic changes and epochal achievements were accomplished in less than 15 years, from 1900 onward.

And, barring the more recent return to the short-wave transmission of the very early days, and crystal control, the above list is, I believe, a truthful catalog of the really significant strides in advance which have made radio engineering what it is today. Everything else, important though it be, and the result of years of careful research and study, may be classified, nevertheless, as an improvement in detail, electrical, mechanical, or chemical, as the case may be.

In truth this young giant, Radio, has attained maturity with astonishing speed. We search in vain for a like development in all the history of man. Radio began to *run* in 1906, ever quickening his stride. Thereafter he received a terrific impetus from the relentless demands of the World War, only to find directly following, instead of a breathing spell, a new incentive, alluringly financial, and aesthetic, in a call which in incredibly few years became nation wide—the *Radio Broadcast*.

Perhaps it is this latter development which, because I envisioned as early as 1907 some of its present-day development and aspects, appeals to me more personally and directly than any other phase of radio.

Beginning my efforts in opera-aria broadcast in 1909, with only prearranged and pathetically meager audiences, I essayed in 1916 with the Columbia Phonograph Company a daily or tri-weekly demonstration of their newest records. I well remember in 1919 when the High Bridge station after the war again began an entertainment service with occasional casual mention of the merits of the new variable condensers and whatnots my company was marketing, frequently overhearing certain disparaging remarks from a rival West Street

radiophone that "*they* had no condensers which they were interested in selling by radio"!

Then and there I learned the lesson that direct advertising by broadcast did not always build good-will. And I have consistently condemned the practice as perverse, pernicious, reflecting on the good name of radio, and distinctly retarding its development.

I did not then foresee the fine excellence of the "sponsored program," or its powerful potentialities in building up the almost incredible demand for receiving apparatus. But the insidious influence of the avaricious advertiser, his stupid insistence on direct, crass, venal advertising has, I regret to observe, become increasingly more and more effective and devastating.

As the so-called "Father of Radio Broadcasting" I wish again to raise my voice in most earnest protest against this revolting state of affairs. The present all too marked tendency of the broadcast chains and of many individual stations to lower their bars to the greed of direct advertising will rapidly work to sap the lifeblood and destroy the greatest usefulness of this magnificent new means of contact which we engineers have so laboriously toiled to upbuild and to perfect. If this stupid venality is not suppressed, if this reptile of etheric advertising is not scotched, we may well resign ourselves to a rapid decadence of a noble institution. Frankly and in all seriousness I attribute a part of the present undeniable slackening in radio sales to the public as actually due to this one cause. The radio public is, I believe, becoming nauseated by the quality of many of the present programs. Short-sighted greed of the broadcasters, station-owners and advertising agencies, is slowly killing the broadcast goose—layer of many golden eggs.

Too long has this perilous situation continued without earnest protest from our organization. We members of this Institute must be jealous of the good name, regardful of a wise supervision of this broadcast institution. We should, I maintain, take active steps (in Washington if need be) to rid ourselves of this stupid, this killing avarice, which is destroying the most splendid and potent means for entertainment, culture, and education which mankind has yet devised.

From this evil the radio manufacturer suffers first—is already severely suffering. But the broadcast agencies will ere long feel the effects of their growing policy in the falling off of large numbers of radio listeners, with resultant loss in advertising receipts. Who of you do not personally know of numerous friends who no longer listen regularly to their radios because of the distasteful advertising which is unceremoniously hurled into their homes?

This situation can be cured. It is of prime importance to us radio engineers that it should be cured. If we anticipate the day of the international broadcast, when American programs are interchanged with those from Europe, you may rest assured that any foreign programs of high-class music will be relished in this country in preference to much of the stuff which American audiences are now compelled to hear.

This factor, the international broadcast, is at hand. The sterling work of radio communication engineers the world over in the fascinating field of short-wave transmission is rapidly bringing it to pass. Perhaps we all too little realize just what this development will eventually mean to the cause of world understanding.

Mutual acquaintanceship between peoples, international amity, eventually an end to war, and finally the blessings of one common tongue.

In this fine affair, it is cause for pride to note that members of the Institute of Radio Engineers have assumed a long lead. And incidental to this work we should expect the foreign membership of the Institute to increase rapidly. This is a feature to which our Membership Committee is to give more careful attention than ever before.

It is to be noted that this year of 1930 will mark the tenth anniversary of the beginning of systematized broadcasting on a regular commercial scale from stations located at San Francisco, Detroit, Newark and Pittsburg, all within a few months of each other.

It has been proposed to commemorate properly this first decade of man's latest and most universal means of contact. If so it may be appropriate and wise that the Institute take steps to advise or direct these decennial plans.

From the earliest beginnings the thrill of adventure has ever characterized work in wireless, more so, I believe, than in any other branch of engineering. And these thrills continue to come to the fortunate radio engineer, each year, each month. For our mistress never ages. Recently outstanding beyond all compare, as a vivid example of the wonder which modern radio has achieved in the progress of communication is the reporting to a breathlessly awaiting world of the recent flight over the South Pole by Commander (now Admiral) Byrd. In that event all the wonder, all the thrilling romance with which radio has endowed and adorned science shines epitomized.

It was not history we were reading. It was not as when, only twenty years ago, Peary came out of the North to file his first dispatches five months after he had reached the Pole. Nor, when for three anxious years following 1910, the outside world did not know whether Scott's

brave party was alive or dead. Not history this, but a gripping present reality of adventure and romance. It is not too much to classify this achievement of Byrd and his associates in radio communication, as the most astounding example in the history of the art of transferring intelligence.

Where it is leading no one can surely tell. Radio of the future can only be guessed at with extreme caution, but we know that it will be forever indispensable to the gatherer of news.

The sum total of what our members, notably those enrolled in the Bureau of Standards and in Naval Radio Research, have contributed during the past two years to the safeguarding of aviation can scarcely be comprehended. Without radio, aviation must inevitably have remained a brave adventure with Chance ever at the controls. Very much yet remains to be done, however, especially in altitude sounding and in "block-signal systems," warning planes of their approach to another, and to mountain sides.

No field of invention calls more imperatively both to the radio and the acoustic engineer than here.

Recently developed in Great Britain, a remarkably practical simplification in small, light-weight facsimile transmission equipment now actually places at the disposal of aircraft this valuable aid to navigation, to give to or from the aviator up-to-the-minute weather charts, or outlines of terrain, either photographic or outlined by pen.

The vacuum-tube amplifier and loud speaker in addition to bringing to millions of homes a form of outside contact which is completely altering the modes of life and mental attitude of our nation, has recently undertaken to revolutionize the theater. This upset of the nation's fourth-sized industry, while the direct outgrowth of radio engineering, has come about in one-third of the time which the broadcast industry required to attain its present state of perfection (or imperfection, as the case may be).

And the above time relation expresses in a rough and general way the comparative *excellence* of the talking picture as compared with the radio today—about one-third as good!

Here, both in studio recording and in theater reproducing methods and apparatus, is witnessed a most deplorable result of engineering indigestion. The profession has bitten off very much more than it could properly masticate in these few years.

But, alas, the resultant belly-ache must be endured by the entire theater-going public! That good old-fashioned English word is alone adequate to express frankly the present situation as regards sound, mechanically or photographically recorded, and loudly reproduced.

As one of the American pioneers in this new development (not yet, surely, may one properly apply the word *Art*) I feel at liberty to talk plainly on this subject.

Recent heroic, and mostly painful, attendance at various leading Broadway successes makes me pause in wonderment that our supposedly blasé Metropolitan audiences will endure, not to mention struggle, to sit in crowded houses to hear that which they hear. Truly, it has been said that the talking picture has taken the noise out of the studio and put it into the theater. Male voices perhaps clearly understandable but all of one timbre, and that wholly unnatural and unpleasing—as if emanating from wooden tonsils and fibre tongues; female voices that lisp, or rasp, and through nasal harshness make all men misogynists; raucous or shrieking “music” which too frequently recalls the olden days of His Master’s Voice—and is almost never either natural or pleasant to hear—these faults seem actually on the increase rather than diminishing.

Admitted that the motion picture producers have in many cases taken over into their own hands the management of microphone and recording apparatus, (although the very best our profession has designed) and liberally botched and boggled the process; and that the film laboratories frequently butcher good negatives into wretched prints. Nevertheless even where the large electrical companies have bodily taken over the film concern from studio to theater the results are all too often deplorably second-rate. In my opinion, despite the tremendously enthusiastic response of the public to sound pictures, what we have done to the better class of motion picture theatre is as yet distinctly retrogressive. Who of you is not actually chagrined and saddened in visiting such theatres, as for example the Rivoli or Rialto, where two years ago one could sit in restful repose listening to masterpieces of music well played by small but symphonic orchestras, or to the soothing diapason of the large organ, to contrast with the present shrieking noises which at best are only a sad burlesque of fine music, painful to endure?

When one makes this comparison, the thought of the thousands of musicians actually put out of employment by this loud-speaking Robot in whose development he perhaps has had a leading, if not criminal, hand, it bids him pause to take counsel with his conscience.

In all seriousness then it behooves us of the radio profession and its by-products to concentrate every human effort upon this urgent and highly baffling task of bringing back real music to the cinema and real voices to the theater screen. Or, if not, let an outrageous and long-suffering public rise in its righteous wrath and curse us.

One word more and I am done. Mythology tells us of a sleeping giant, the Cyclops, having one eye centered in his forehead. Today that giant is yet an infant—Television, with one pink eye. But already he is stirring, is growing, already muttering radio sound, and groping in the dark to find in which way to travel.

Let us begin now to watch closely this wonder, to guide by careful thought, by standardization of line and frequency bands his broadcasting, to the end that in the briefest possible time we may have, in as equally perfected form and available for every home, the visual accompaniment of the radio voices. This advance is so closely at hand that the organization of an Institute Committee on Television may now be in order.

Fellow members of the Institute of Radio Engineers, as one of the founders who has followed through the swift years the still swifter growth of this splendid science—I take justifiable pride in all your amazing achievements.

Conscious of our past triumphs over nature (physical and human), frankly acknowledging the shortcomings still to be made good, let us not pause a moment in our onward stride, but again highly resolve that what radio has thus far accomplished in the cause of a higher civilization is but a brave beginning, the blazing of a trail, an earnest of yet greater things which lie before us for the welfare of mankind.